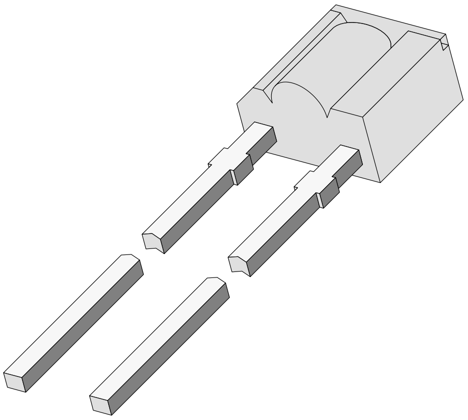
# GaAs IR Emitting Diode in Side View Miniature Package

## Description

TSSS2600 is a miniature infrared emitting diode in GaAs on GaAs technology, molded in a clear, untinted plastic package with cylindrical side view lens.
The device is spectrally matched to silicon photodiodes and phototransistors.



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## Features

- Low forward voltage
- Suitable for DC and high pulse current operation
- Side view emitter for miniature design
- Horizontal angle of half intensity ± 25°
- Vertical angle of half intensity ± 60°
- Peak wavelength $\lambda_p$ = 950 nm
- High reliability
- Good spectral matching to Si photodetectors

## Applications

Infrared source in miniature light barriers or reflective sensor systems with short transmission distances and low forward voltage requirements. Matching with silicon PIN photodiodes or phototransistors (e.g. TEST2600)

## Absolute Maximum Ratings

$T_{amb}$ = 25°C

| Parameter | Test Conditions | Symbol | Value | Unit |
|---|---|---|---|---|
| Reverse Voltage | | $V_R$ | 5 | V |
| Forward Current | | $I_F$ | 100 | mA |
| Peak Forward Current | $t_p/T = 0.5$, $t_p = 100\ \mu s$ | $I_{FM}$ | 200 | mA |
| Surge Forward Current | $t_p = 100\ \mu s$ | $I_{FSM}$ | 2 | A |
| Power Dissipation | | $P_V$ | 170 | mW |
| Junction Temperature | | $T_j$ | 100 | °C |
| Operating Temperature Range | | $T_{amb}$ | –55...+100 | °C |
| Storage Temperature Range | | $T_{stg}$ | –55...+100 | °C |
| Soldering Temperature | t ≦ 5sec, 2 mm from case | $T_{sd}$ | 260 | °C |
| Thermal Resistance Junction/Ambient | | $R_{thJA}$ | 450 | K/W |

## Basic Characteristics

$T_{amb} = 25°C$

| Parameter | Test Conditions | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Forward Voltage | $I_F$ = 100 mA, $t_p$ = 20 ms | $V_F$ |  | 1.25 | 1.6 | V |
|  | $I_F$ = 1.5 A, $t_p$ = 100 μs | $V_F$ |  | 2.2 |  | V |
| Temp. Coefficient of $V_F$ | $I_F$ = 100mA | $TK_{VF}$ |  | –1.3 |  | mV/K |
| Reverse Current | $V_R$ = 5 V | $I_R$ |  |  | 100 | μA |
| Junction Capacitance | $V_R$ = 0 V, f = 1 MHz, E = 0 | $C_j$ |  | 30 |  | pF |
| Radiant Intensity | $I_F$ = 100 mA, $t_p$ = 20 ms | $I_e$ | 1 | 2.6 |  | mW/sr |
|  | $I_F$ = 1.5 A, $t_p$ = 100 μs | $I_e$ |  | 25 |  | mW/sr |
| Radiant Power | $I_F$ = 100 mA, $t_p$ = 20 ms | $\phi_e$ |  | 20 |  | mW |
| Temp. Coefficient of $\phi_e$ | $I_F$ = 100 mA | $TK_{\phi e}$ |  | –0.8 |  | %/K |
| Angle of Half Intensity | horizontal | $\varphi_1$ |  | ±25 |  | deg |
|  | vertical | $\varphi_2$ |  | ±60 |  | deg |
| Peak Wavelength | $I_F$ = 100 mA | $\lambda_p$ |  | 950 |  | nm |
| Spectral Bandwidth | $I_F$ = 100 mA | $\Delta\lambda$ |  | 50 |  | nm |
| Temp. Coefficient of $\lambda_p$ | $I_F$ = 100 mA | $TK_{\lambda p}$ |  | 0.2 |  | nm/K |
| Rise Time | $I_F$ = 100 mA | $t_r$ |  | 800 |  | ns |
|  | $I_F$ = 1.5 A | $t_r$ |  | 400 |  | ns |
| Fall Time | $I_F$ = 100 mA | $t_f$ |  | 800 |  | ns |
|  | $I_F$ = 1.5 A | $t_f$ |  | 400 |  | ns |

## Typical Characteristics ($T_{amb} = 25°C$ unless otherwise specified)

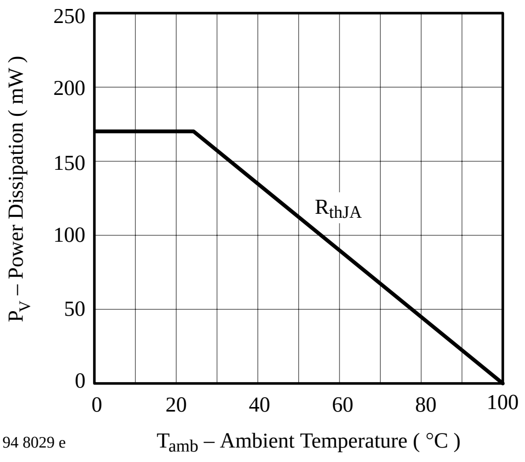


Figure 1. Power Dissipation vs. Ambient Temperature

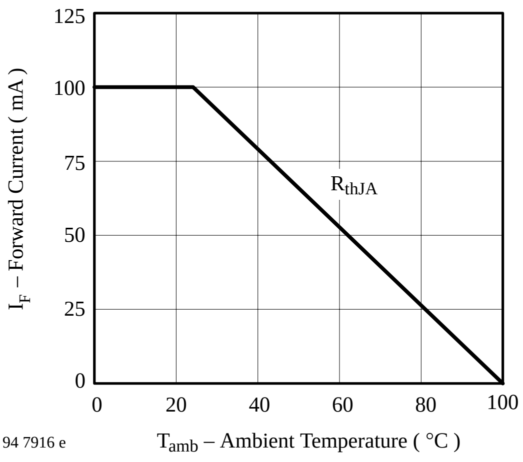


Figure 2. Forward Current vs. Ambient Temperature

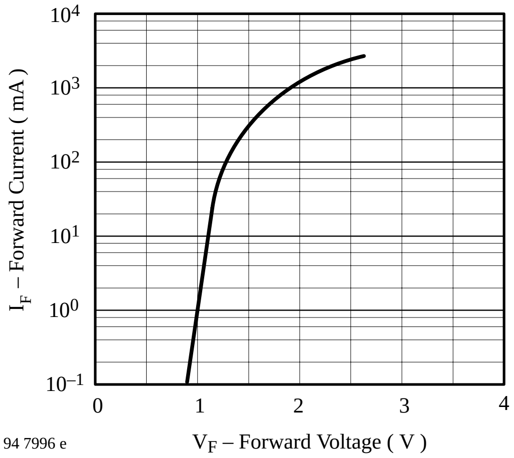


Figure 3. Forward Current vs. Forward Voltage

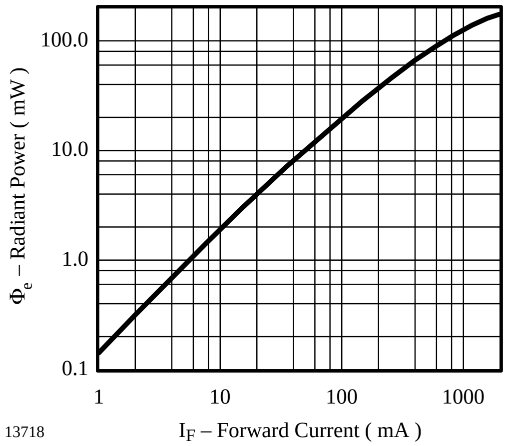


Figure 6. Radiant Power vs. Forward Current

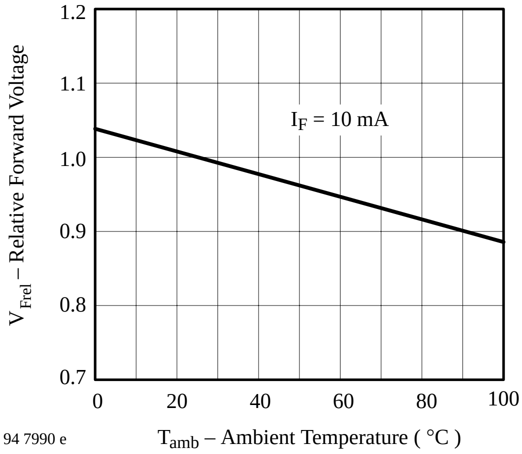


Figure 4. Relative Forward Voltage vs. Ambient Temperature

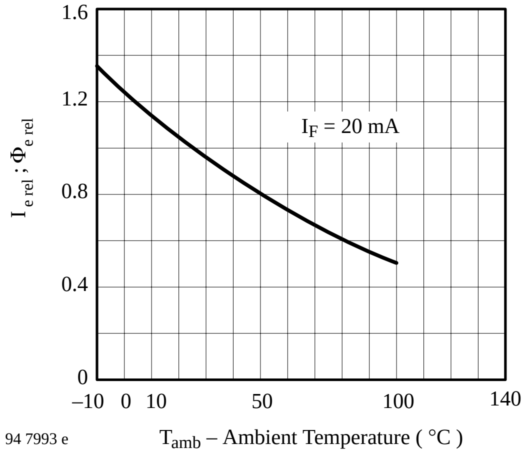


Figure 7. Rel. Radiant Intensity\Power vs. Ambient Temperature

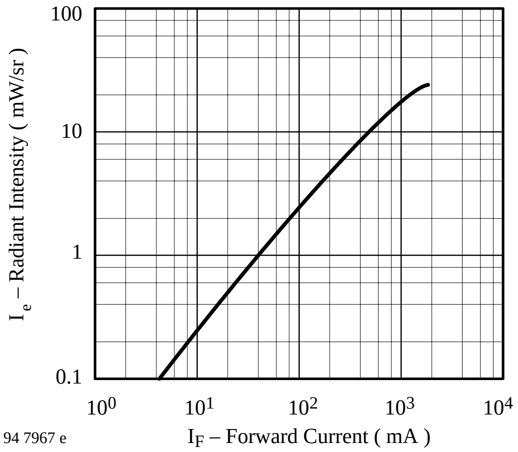


Figure 5. Radiant Intensity vs. Forward Current

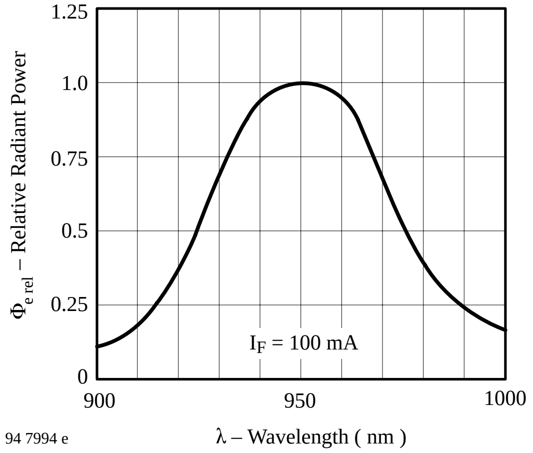


Figure 8. Relative Radiant Power vs. Wavelength

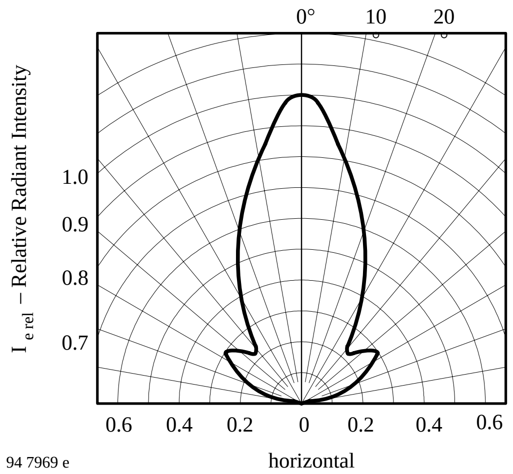


Figure 9. Relative Radiant Intensity vs. Angular Displacement

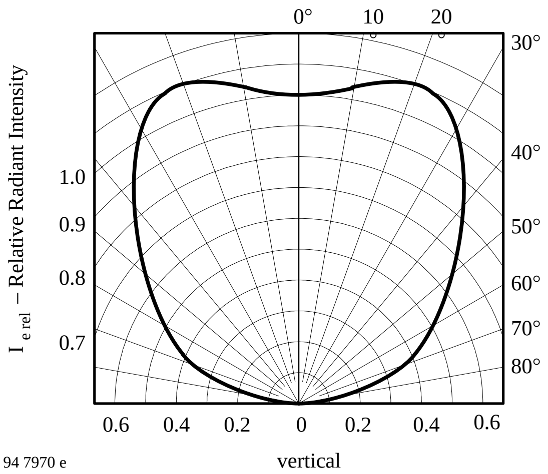
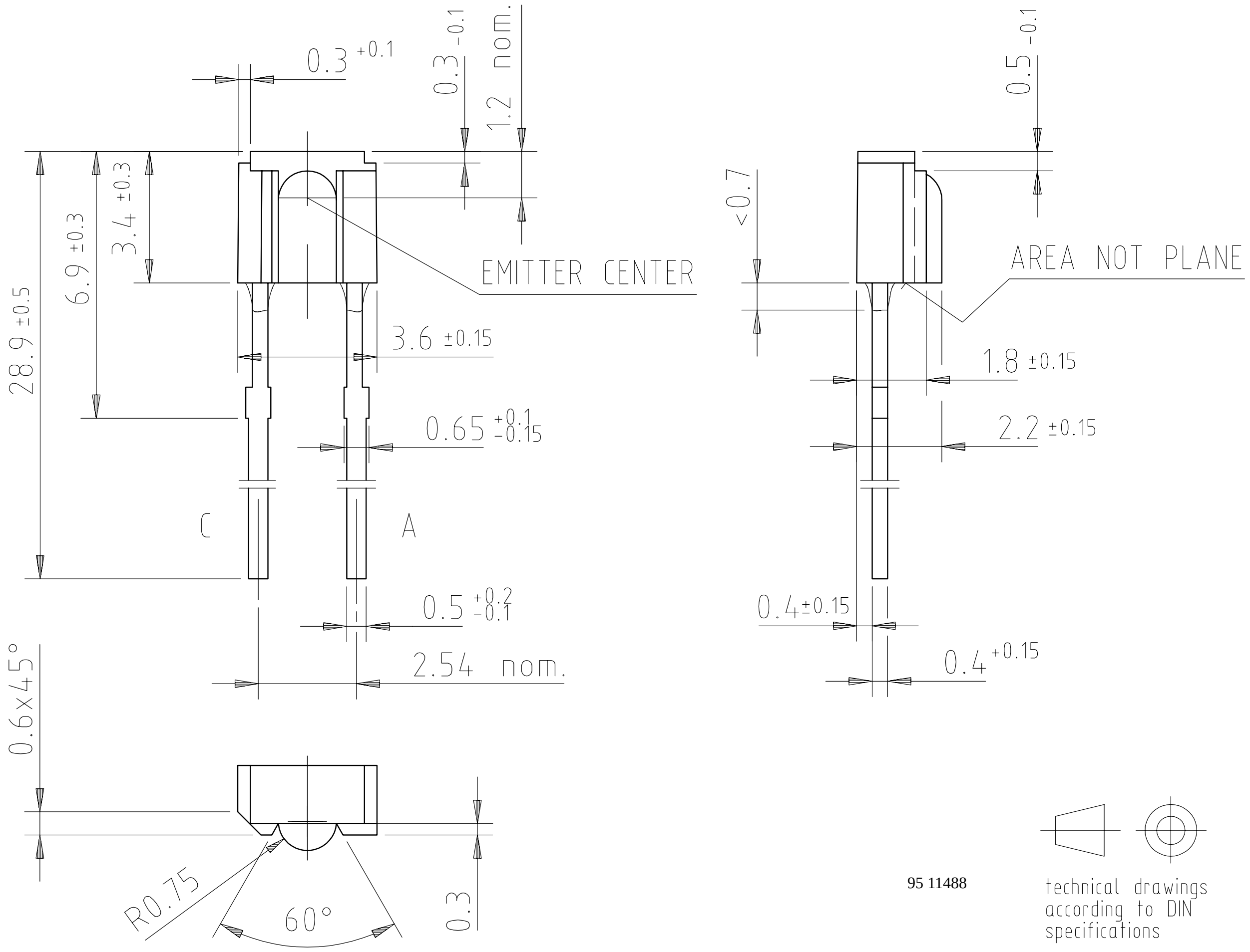


Figure 10. Relative Radiant Intensity vs. Angular Displacement

## Dimensions in mm



## Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

**Vishay Semiconductor GmbH** has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

**Vishay Semiconductor GmbH** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

**We reserve the right to make changes to improve technical design and may do so without further notice.**
Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay-Telefunken products for any unintended or unauthorized application, the buyer shall indemnify Vishay-Telefunken against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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